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Eliminating Hum Bars

A "hum bar" of the type usually associated with interference from silicon power-supply rectifiers may appear in the picture in weak-signal areas. In some cases this interference occurs when the neon channel-indicator lamps are operated on ac tapped off terminal 2 (the cold side) of on-off switch S4101. Later production models have the lamps operated off dc as in the partial schematic in Fig. 1. The two 22,000-

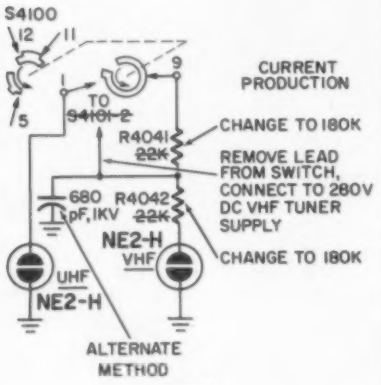

FIG 1

ohm limiting resistors have been changed to 180,000 ohms and the supply line to the lamps is removed from the switch and connected to the 280-volt dc line to the vhf tuner.

An alternate method, which may eliminate the interference on one channel and not on another is to add a 680-pF, 1-kV capacitor as shown.

In early-production model EQ-447 sets using the CTC 55 chassis, the bar interference may develop when the set is tuned to low uhf channels. This may result from improper uhf antenna cable

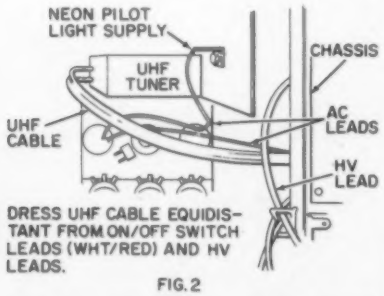

FIG. 2

lead dress. As shown in Fig. 2, it should be positioned equidistant between the on-off switch leads and the high-voltage leads. In later production, a bead link wire tire secures the cable in this position.—*RCA TV Service Data* **R-E**

AUTOMATIC COLOR CIRCUITS
(continued from page 56)

Perma-Tint

Perma-Tint (Sylvania appears to spell it with and without the hyphen) atc circuits correct phase errors in Sylvania receivers. Normally, the demodulation angle is 100°—the Z axis at 170 and the X axis at 70 degrees. The atc circuit widens the demodulation angle to 130° by inserting additional phase-shift components into the demodulator circuits. The Z axis is shifted to 200° while the X axis is held at 70°. Figure 6 is the basic circuit used in the EO-10 chassis.

Closing the PERMA-TINT switch applies forward bias to the switching transistors; driving them to saturation to connect phase-shift networks L2-R9 and C2-R8 into the circuit and widen the demodulation angle. This changes the amplitudes of the drive signals to the R – Y and B – Y from their normal levels. Now, a phase error tending to make purple faces produces less X-drive to the R – Y amplifier and little or no Z-drive to the B – Y amplifier. This causes flesh tones to shift into the orange region where they are more acceptable.

Phase error tending toward greenish yellow faces when the demodulation angle is 100° will, with atc, reduce the X-drive to the R – Y amplifier a little while the Z-drive to the B– Y amplifier is greatly increased. This shifts the fleshtones into the orange range.

Fig. 7 shows the Perma-Tint circuit in the D14-12 chassis. Activating the atc circuit drives the X and Z phase switching to saturation, thus inserting the phase-shift networks across the emitters of the X and Z demodulators.

Like the other circuits discussed here, the RCA AccuTint atc circuit alters the R – Y and B – Y demodulation axes and, in addition, reduces the amplitude of the R – Y signal for better fleshtone rendition. The basic AccuTint circuit is in Fig. 8.

When the ACCUTINT switch is placed in the ON position, an additional phase-shift network (8.2 μH shunted by 56 ohms) is switched into the circuit to shift the phase of the 3.58-MHz CW signal fed to the B – Y demodulator. The shift in the R – Y signal results from detuning of the 3.58-MHz transformer as the added network is connected across its secondary. The change in the B – Y axes is slight but is away from the Q axis so as to prevent the Q signal from contaminating the fleshtones.

The 8200-ohm resistor switched across the B – Y demodulator output causes the output of the B – Y amplifier to fall to approximately 80% of the R – Y signal level. The B – Y output is 120% of R – Y when atc is turned off.

The AccuMatic circuit's operation is similar to AccuTint while optimizing the COLOR and TINT controls by sharply restricting their operating ranges. Figure 9 is the basic AccuMatic circuit. The switch is shown in the OFF position. Section C applies –11.2 volts to the anode of D1, driving it to saturation and grounding the junction of C4 and L4. Section D of the switch ties together the kine-driver emitters through 150-ohm resistors.

When the atc is turned on, the bias is removed from D1, cutting it off to switch L4 and C4 into the circuit. This changes the phase and amplitude of then 3.58-MHz signal to the B – Y demodulator. Section D modifies the gains of the blue kine-driver by disconnecting it from the others.

Sections A and B of the atc switch set the range of the COLOR and TINT controls. When turned off, both controls have a very wide range. When atc is on the range of the controls is severely limited—allowing only minor deviation from the optimum setting.

For example, with atc turned off, the TINT control's range is from deep green through deep purple as the resistance from pin 2 of the demodulator module to ground is varied from 35,000 to 10,000 ohms. When the atc is on, the resistance in the tint control circuit has a maximum of around 27,000 ohms and a minimum of 22,000 ohms, thus limiting tint adjustments to the range of normal fleshtones. **R/E**

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***Construction articles: † part of larger article, ER (equipment report), NC noteworthy circuits, Corr (correction), CI (service clinic); P (programmed)**